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## 2012 Ratio Study Format

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### Overview

This document describes the format to be used for the 2012 General Reassessment ratio studies. Changes from the previous format are designed to: (1) make it easier for the field staff to evaluate the ratio study in SPSS; and (2) make it easier to reconcile the sales data used in the ratio study with the sales disclosure data analyzed by the Data Division.

Like prior years, the ratio study should be submitted as an MS Excel-compatible spreadsheet with one spreadsheet tab for each of the six major property classes. These classes are:

- Industrial Vacant
- Industrial Improved
- Commercial Vacant
- Commercial Improved
- Residential Vacant
- Residential Improved

In addition, the study should contain a **Summary** tab detailing the number of sales used and ratio statistics for each section of the ratio study.

The data on these seven tabs can be presented as the county sees fit: this part of the ratio study is unchanged from prior years. As in prior years, data in these tabs will be reviewed by Department of Local Government Finance (“Department”) field staff to ensure an adequate number of sales were used and that combined townships represent similar market areas.

Beginning in 2012, the Department will use the SPSS software program to calculate all ratio statistics, such as the median, COD, and PRD. We have added two new spreadsheet tabs to the ratio study to facilitate this review. The first tab is entitled **Formatted**. This tab will contain the ratio study information presented on the other six tabs in a format compatible with the SPSS software program. The second tab is entitled **MultiParcelSales**, and will list all the sales data for all multiple parcel sales listed in the **Formatted** tab.

Both of these new tabs are described below. In addition, a sample ratio study file has been provided with this document to show how the data should look when formatted correctly.

All formatting can be done in MS Excel or a similar program. Although the data should be formatted so SPSS can understand it, **the SPSS software program is not needed to format the data.**

### **The *Formatted* Tab**

As previously stated, the Department will use the SPSS software program to evaluate all ratio studies for the 2012 General Reassessment. This program can calculate ratio statistics much faster than in MS Excel. However, the ratio study data must be presented in a format compatible with the SPSS program to do the analysis. The ***Formatted*** tab will contain the county ratio study data in a format compatible with the SPSS program.

Table 1 lists the fields to be included on the ***Formatted*** tab.

**Table 1: Field Names and Formats**

<b>Field Name</b>	<b>Format</b>	<b>Example</b>
<b>SDFID</b>	Text	C01-2012-0000001
ParcelNumber	Text	01-00-00-000-000.000-001
<b>MultiParcel</b>	Text	Y
<b>StudySection</b>	Text	ResImp
<b>Grouping</b>	Text	CombinedResVac
Township	Text	Adams
Neighborhood	Text	1000
PropertyClass	Text	510
TaxingDistrict	Text	001
SaleDate	Date	1/1/2012
StudySalePrice	Number	100,000
CurrentLandAV	Number	20,000
CurrentImpAV	Number	80,000
CurrentTotalAV	Number	100,000

Many of these fields are self-explanatory: for example, the ParcelNumber field is the state 18-digit parcel number. The four fields printed in bold (**SDFID**, **MultiParcel**, **StudySection**, and **Grouping**) are new for the 2012 review and will be described below. These new fields are only needed in the ***Formatted*** tab of the ratio study, although they may be included in other tabs if desired.

The fields should have the field names listed in Table 1, and the names should be typed without spaces: for example “ParcelNumber” instead of “Parcel Number.” The SPSS software does not allow spaces in the variable names it is analyzing.

The field name should be listed in the first row of the ***Formatted*** spreadsheet tab. Data for each field should be listed in the column directly underneath the field name. For example, parcel number data should be listed in the column with the **ParcelNumber** field in the first row. There should be no blank rows between the field name and the first row of data; that is, the first line of data should begin on the second row.

Beginning with the second row, each row should contain data on one sale used in the ratio study. There should be no blank rows between sales, even when the sales are in a different property class or township. The SPSS software will treat any blank rows as invalid data, and the statistics it computes will not be correct. This format adds two additional fields (**StudySection** and **Grouping**) to the *Formatted* tab that will tell SPSS how to group the sales by major property class and township.

Since the data in the *Formatted* tab is a copy of the ratio study data in a format that SPSS can easily import, in most cases the data for each sale will be the same as the data listed in one of the other six tabs. For example, a sale listed in the residential improved tab should have the same parcel number, sale price, and other information in the *Formatted* tab.

There are two exceptions to this: first, sometimes counties adjust the sale price of certain sales for time or other reasons. The **StudySalePrice** should contain the adjusted sale price if adjustments have been made. If no adjustments were made, then the sale price should be used. This will ensure that the ratio statistics calculated by SPSS use the adjusted sales price if one is provided.

Second, only one parcel of a multi-parcel sale should be listed on the *Formatted* tab. All of the parcels will be listed on the *MultiParcelSales* tab (described below) in case a full reconciliation is needed. More information on which parcel to list on the *Formatted* tab and what information to provide is described below.

A description of each of the four new fields follows.

### **The StudySection Field**

Since the *Formatted* tab contains the full set of data, without labeling the data by a tab within MS Excel, the **StudySection** field was added to tell SPSS which part of the study a sale was used in (for example, the residential improved part). This way, when the ratio study is analyzed in SPSS, the data can be stratified by the six major property classes so that each class is analyzed separately.

The **StudySection** field can have one of six entries, each corresponding to one of the six major classes of the ratio study:

- IndVac
- IndImp
- ComVac
- ComImp
- ResVac
- ResImp

The entry listed in this column for each sale should correspond to the part of the study the sale was used in. For example, a sale used in the residential improved part of the study should be listed as “ResImp.” The entries listed here should be used without spaces or other changes.

When the ratio study is analyzed in SPSS, the program will stratify the study and calculate the statistics by the six different sections and by township. The **Grouping** field will tell SPSS what townships are grouped together so that they can be reviewed as one unit.

### The Grouping Field

Many counties combine townships in some parts of the ratio study due to lack of sales or to achieve better uniformity across similar market areas. For example, townships may be grouped together to value vacant land. In SPSS, the ratio study analysis can be stratified by township so that each township is reviewed separately. If some townships are combined for ratio study purposes, SPSS needs additional information in order to analyze these townships as one group and not as separate townships.

The **Grouping** field gives SPSS this information. It must contain one of the two following values for each sale in the ratio study:

- The name of the group the parcel should be analyzed with
- The entry “None,” if the parcel should be analyzed as part of the township only

The group name can be any text string. It should be the same for all parcels in the group and different from any other group names. For example, if Adams and Boone Townships are combined, the group name could be AdamsBoone. Table 2 shows an example of how this would look on the **Formatted** tab of the ratio study (only the relevant fields are shown).

Table 2: Example of Grouped Townships

<u>ParcelNumber</u>	<u>StudySection</u>	<u>Grouping</u>	<u>Township</u>
01-00-00-00-000.000-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.001-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.002-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.003-001	ResVac	AdamsBoone	Boone
01-00-00-00-000.004-001	ResVac	AdamsBoone	Boone

When the ratio study is analyzed in SPSS, these parcels will be stratified by the **Grouping** name instead of the **Township** name. This ensures that these five parcels are analyzed together, instead of the 3 Adams Township and 2 Boone Township parcels being analyzed separately. If the townships should be analyzed separately, then the **Grouping** value would be listed as “None” for each of these five parcels.

As in prior years, the Department will generally defer to local decisions on which townships should be grouped together for ratio study purposes. Townships that are not explicitly grouped together (that is, with the **Grouping** value set to “None”) will be analyzed separately.

Often, townships are combined for some parts of the study but not others. For example, many counties combine townships for the residential vacant study, but keep these townships separate for the residential improved study. If townships are grouped together for one part of the study but

not another, the **Grouping** name should only be provided for the part of the study where they were combined. In the part of the study where the townships were not combined, the **Grouping** field should be marked as “None.”

For example, Table 3 shows data for ten parcels. The first five parcels are part of the residential vacant study, and are grouped together in the “AdamsBoone” group. These five parcels will be analyzed together even though they are in two different townships.

The remaining five parcels are part of the residential improved study, and are not grouped together. Since they belong to two different townships, these five parcels will be analyzed at the township level—three parcels in Adams and two parcels in Boone. This is the case even though Adams and Boone Township were combined for the residential vacant part of the study.

**Table 3: Example of Grouped and Ungrouped Townships**

<b><u>ParcelNumber</u></b>	<b><u>StudySection</u></b>	<b><u>Grouping</u></b>	<b><u>Township</u></b>
01-00-00-00-000.000-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.001-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.002-001	ResVac	AdamsBoone	Adams
01-00-00-00-000.003-001	ResVac	AdamsBoone	Boone
01-00-00-00-000.004-001	ResVac	AdamsBoone	Boone
01-00-00-00-000.005-001	ResImp	None	Adams
01-00-00-00-000.006-001	ResImp	None	Adams
01-00-00-00-000.007-001	ResImp	None	Adams
01-00-00-00-000.008-001	ResImp	None	Boone
01-00-00-00-000.009-001	ResImp	None	Boone

### **The MultiParcel Field and *MultiParcelSales* tab**

Many counties and vendors use multiple parcel sales in their ratio studies. The Department considers this acceptable while noting the special precautions that must be taken when using such sales. These precautions are outlined in the 2007 *IAAO Standard on Ratio Studies*.

Multiple parcel sales are challenging to analyze, because there is only one sale price but more than one assessed value. In the ratio study, the sale price must be compared to the total assessed value of all the parcels. In addition, some multiple parcel sales involve properties with different property classes or property characteristics. On one hand, SPSS needs one row of data for the sale with aggregate information about all the parcels to compute accurate ratio statistics. On the other hand, information about each individual parcel is needed to determine the validity of the sale.

Currently, counties have many different ways of formatting multiple parcel sales in the ratio study. For the 2012 ratio study, counties can continue to use their preferred format in the six tabs detailing the separate parts of the ratio study. However, we ask that multiple parcel sales on the *Formatted* tab be formatted as follows:

- Include only one parcel from each multiple parcel sale in the *Formatted* tab. Use the primary parcel if there is one. If there is no primary parcel, please include the first parcel listed on the sales disclosure.
- Along with the parcel number, include the other characteristics of the primary or first parcel in the sale, the total sale price of **ALL** parcels in the sale, and the land, improved, and total assessed value of **ALL** parcels in the sale.
- Mark the **MultiParcel** column for this parcel as “Y.”

This format will provide one row of data to SPSS for each multiple parcel sale. Because the total sale price and total assessed value of all parcels is included in this row, the ratio study statistics and number of sales will be accurate. Marking the **MultiParcel** column as “Y” will allow SPSS to reconcile this aggregate parcel information with the individual parcel information if necessary. This process is described below.

In order to preserve the individual parcel information, parcel information for each parcel in each multiple parcel sale should be listed on the *MultiParcelSales* tab. This tab should contain the same fields as the fields on the *Formatted* tab (listed in Table 1). The tab should also contain one additional field named **Primary**. The **Primary** field should be marked “Y” for the parcel listed on the *Formatted* tab and “N” for all other parcels in each sale. SPSS will use the information from the primary parcel to reconcile the individual parcel characteristics listed on the *MultiParcelSales* tab with the aggregate parcel data on the *Formatted* tab.

In summary, each parcel in the sale should be listed on the *MultiParcelSales* tab with its own parcel characteristic information. One of these parcels will also be listed on the *Formatted* tab with its characteristic information, the total sale price, and the total land, improved, and total assessed value of all parcels in the sale. On the *Formatted* tab, this sale will have the **MultiParcel** field marked with a “Y.” On the *MultiParcelSales* tab, this sale will also have the **Primary** field marked with a “Y.” All other parcels listed on the *MultiParcelSales* tab as a part of this sale will have the **Primary** field marked with an “N.”

The following is an example of how this formatting would look. Table 4 lists the relevant data for a multiple parcel sale involving two parcels (only the last nine digits of the parcel number are shown).

Table 4: Parcel Information for Multi-Parcel Sale

<u>Parcel Number</u>	<u>Property Class</u>	<u>Current LandAV</u>	<u>Current ImproveAV</u>	<u>Current TotalAV</u>
000.000-001	510	19,500	95,000	119,000
000.001-001	500	21,000	0	21,000

Assume these parcels sold together for \$135,000. Table 5 shows the data to provide on the *MultiParcelSales* tab for this sale. As can be seen, it is the same data shown in Table 4, with the addition of the **Primary** field. This field is marked with a “Y” for the primary parcel (here, the

improved parcel), and with an “N” for the other parcel. Finally, the sale price of \$135,000 is entered for both parcels in the **StudySalePrice** field.

Table 5: Parcel Data Stored in MultiParcelSales Tab of Ratio Study

<u>Parcel Number</u>	<u>Primary</u>	<u>Property Class</u>	<u>Study SalePrice</u>	<u>Current LandAV</u>	<u>Current ImproveAV</u>	<u>Current TotalAV</u>
000.000-001	Y	510	135,000	19,500	99,500	119,000
000.001-001	N	500	135,000	21,000	0	21,000

This sale would also be entered on one row of the *Formatted* tab of the ratio study. The relevant fields for the entry are shown in Table 6.

Table 6: Parcel Data Stored in Formatted Tab of Ratio Study

<u>Parcel Number</u>	<u>MultiParcel</u>	<u>Property Class</u>	<u>Study SalePrice</u>	<u>Current LandAV</u>	<u>Current ImproveAV</u>	<u>Current TotalAV</u>
000.000-001	Y	510	135,000	40,500	99,500	140,000

As can be seen, the parcel number and property class are the same as those of the primary parcel in the *MultiParcelSales* tab. The current land, improvement, and total assessment is the sum of these values for both parcels. The sale price is entered in the **StudySalePrice** field. Since the property sold for \$135,000, the sales ratio will be  $\$140,000/\$135,000 = 1.03$ . The **MultiParcel** field is also marked “Y” to indicate to SPSS that this is a multiple parcel sale.

Using this format, data from multiple parcel sales can be used in the ratio study in a format that SPSS can understand, while the complete parcel information is preserved in case further analysis is needed.

### The SDFID Field

Prior to ratio study approval, the Department must ensure an adequate number of sales were used. To do this, the Department reconciles the annual sales data submitted by the county to our Data Division (the SALECONTAC, SALEDISC, and SALEPARCEL files) with the sales used in the ratio study. Reconciling these two files helps ensure the integrity of assessments by verifying that an adequate number of sales that took place for valuable consideration are used in the ratio study.

This reconciliation process can be time-consuming, in part because the sales data in the ratio study does not always uniquely identify the sale. For example, a parcel may sell twice, with only the latest sale being used in the ratio study. If a match is done between the ratio study and the annual sales data on parcel number, there will be two possible matches in the annual sales data.

To make the reconciliation more efficient, the SDF\_ID value for each sale in the annual sales file submitted to the Data Division should also be listed in the new **SDFID** column on the *Formatted* tab of the ratio study. The SDF\_ID (Sales Disclosure Form ID) is a unique identifier assigned to each sales disclosure; if a parcel sells more than once, each sale will have a unique SDF\_ID. Since the SDF\_ID for each sale is included in the annual sales data file sent to the Data Division,

including this information in the ratio study allows the Department to automate the reconciliation process and provide a detailed list of any sales that we need further information on.

For counties that use the state-offered online sales disclosure website, the program automatically assigns a unique SDF\_ID to each sale as it is entered. For counties that use a third-party program, the vendor will assign the SDF\_ID prior to sending the annual sales data to the Department. In both cases, the Department will send a copy of the approved annual sales data files containing the SDF\_ID for each sale to the county once the files have been reviewed for accuracy. The Department will use these same data files to perform the sales reconciliation with the ratio study. This means that prior to submitting the ratio study, each county will have a copy of the data files that the Department will use during the reconciliation process listing the SDF\_ID for each sale that took place during the year. During reconciliation, the person reviewing the ratio study will send each county a list of sales where additional information is needed.

For the 2012 ratio study, we ask that the SDF\_ID be included for each sale taking place during the 2011 sales year (March 1, 2011 through March 1, 2012). We encourage counties to include the SDF\_ID from the prior 2010 sales year as well in the ratio study if time permits. Sales from the 2009 and earlier sales years cannot be reconciled automatically, so no SDF\_ID is requested.

The list of reconciled sales sent to the county will only include sales with a valid SDF\_ID provided in the ratio study. The SDF\_ID must be the same in both the ratio study and the sales data file, and the reconciliation will be performed using the matching data in these two files. Summary information on the number of sales without a valid SDF\_ID and sales prior to the 2010 sales year will also be provided. If the automated reconciliation does not provide enough information, the Department will perform further reconciliation by hand as in prior years.

Questions on this memo may be directed to Barry Wood, Assessment Division Director, at [bwood@dlgf.in.gov](mailto:bwood@dlgf.in.gov) or 317.232.3762 or David Schwab, Senior Statistician/Application System Analyst, at [dschwab@dlgf.in.gov](mailto:dschwab@dlgf.in.gov) or 317.234.5861.